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Studies in *Sisyrinchium*—I: Sixteen new Species from the Southern States

BY EUGENE P. BICKNELL

Only a few years ago our familiar Blue-eyed Grass was looked upon as a plant common to nearly all parts of North America and as being the only one of its genus occurring in all that wide extent of country except in the farthest west.

The species—actually the extensive *group* of species—has thus been altogether misunderstood.

Nearly ten years ago Dr. Watson, after a critical study of eastern plants, announced that two forms might fairly be regarded as distinct; but this view was not generally understood, and Dr. Morong, who examined the problem in the interest of the A. A. S. "List," published in 1893-4, reached the conclusion that but one eastern species should be accepted.

A familiar acquaintance with the forms occurring about New York City enabled me, two years later, confidently to define three eastern species and to intimate that yet others awaited critical discrimination. It was then my hope that the subject would be taken up by some one having wider opportunity for study, but as no new word on blue-eyed grasses had been said up to the present year, while the need of a better understanding of them had been pressingly brought to my attention, the study of our species was resumed. It seems, however, that the group has not been so entirely neglected as had been believed. This appears from a recent signature of "*Pittonia*," wherein Professor Greene adds five species to the number known from North America. Three of these are well known to me as excellent species. Two of them come within the scope of the present paper, one a strongly characterized Floridan plant, well named *S. xerophyllum*, the other from Louisiana, *S. Langloisii*, which from the description is evidently quite different from anything that has come under my notice.

The present series of papers may be taken as preliminary to a general review of the genus in North America.

My acknowledgments to many friends and correspondents for

the loan of indispensable material must be deferred to the final writing.

Sisyrrinchium corymbosum

Tall and long-leaved, 30–62 cm. high, in scant tufts not fibrose at base, arising from distinct ascending rootstocks, the crowded roots becoming coarse and woody. Plant pale dull green and glaucescent, turning yellowish or brownish-green in drying, the spathes and bracts of the inflorescence sometimes purplish-tinged : leaves decidedly equitant at base in stout plants, stiffly erect and thickish, or becoming so, some of them usually surpassing the first node of the stem, closely striate, not rugulose, the edges smooth or nearly so or upwardly ciliolate towards the very acute apex : stem 2–4 mm. wide, flattened, the stem proper often much broader than the firm wing-margins, the sharp edges smooth or nearly so : inflorescence long-branched, fastigate-subcorymbose, two or three times compound, the second series of branches and the peduncles in clusters of two or three or more, arising from short sheathing bracts ; branches 7–14 cm. long to the slender peduncles which are about as long and more or less serrulate : lowest bracteal leaf foliaceous, erect, 4–8 cm. long, those above much reduced and bract-like, 1.5–3.5 cm. long, usually clasping for about half their length and oppositely bi-carinate at base : spathes erect or deflected, small and narrow, mostly 12–15 mm. long, the nearly equal bracts thin and membranous, delicately nerved, acute or subulate, the margins rather broadly white-hyaline, the outer one tubular-clasping for at least one third its length ; interior scales much shorter than the bracts : flowers blue, small, numerous, 8–11, on exserted, slightly spreading pedicels, 10–15 mm. long, becoming 15–22 mm. long in fruit ; perianth delicate, apparently only 8–10 mm. long ; staminal column 3–4 mm. high : capsules broadly oblong, 3–5 mm. high, thick-walled, becoming dark brown ; seeds globose, 1 mm. in diameter, faintly pitted or nearly smooth.

Florida : “Pine barrens near Jacksonville,” A. H. Curtiss, “no. 4584, Curtiss’ Second Distribution of plants of the southern United States,” March 17, 1894, just in flower ; June 1, 1894, over-ripe fruit. In Herb. U. S. National Museum.

Alabama : Mobile, Dr. Chas. Mohr, “Damp grassy banks :” just in flower April 5, 1897. In Herb. Dr. Chas. Mohr. Apparently a reduced form of the type, more slender and less branched, with elongated bracteal leaf.

A fine species, when well developed much the largest of the genus in the eastern United States. It is well characterized by its

branched, sub-corymbose, bracteate inflorescence and long stiffly erect leaves.

Sisyrrinchium solstitiale

Known only in its early-flowering stage. Thinly tufted from erect woody rootstocks, the very slender roots long and wiry, the bases of the tufts clothed with chaffy and loosely fibrillose remains of decayed leaves. Stems and leaves pale dull green or glaucescent, turning dull brownish-green in drying: leaves very straight and erect, 15–25 cm. long, about half the height of the plant, very narrow when young, becoming 4 mm. wide, evenly graduated to the stiff acicular apex, striate, the nerves mostly prominent and obscure in an alternating series, the intervals minutely transversely rugulose; margins of the leaves for a width of about .5 mm. thinner and paler than the interior portion in evident contrast, at least in the dried plant, the extreme edge hyaline and minutely serrulate, becoming smooth; stems once or twice spirally twisted, forming an erect double curve, 20–46 cm. or more tall, becoming 3 mm. wide, the firm wings hyaline-margined and obscurely serrulate, becoming smooth: inflorescence elongated, narrow, from three rather remote nodes, each supporting an erect, foliaceous bracteal leaf and one or two peduncles, or the lower one bearing a slender branch having a bracteal leaf and two peduncles: spathes dull green, straight, 2–2.5 cm. long, the bracts stiff, closely striate-nerved, subequal, acute or aculate, the outer one narrowly acuminate, its margins below white-hyaline, united around the inner for 6–8 mm., or over one third of its length; interior scales acuminate, finally equaling the bracts: flowers blue, rather strongly veined, apparently few, about 12 mm. long, on erect slightly exserted pedicels.

Collected by Mr. Geo. V. Nash in high pine land at Eustis, Lake Co., Florida, Aug. 10, 1894, the first flowers just opened. Type in herbarium Geo. V. Nash.

A very distinct species remarkable for its late flowering period. *S. xerophyllum* Greene, which occurs at the same locality, flowers in March, five months earlier in the season.

SISYRINCHIUM XEROPHYLLUM Greene, Pittonia, 4: 32. 17 M. 1899.

Tufts coarsely brown-fibrose at base from compound woody rootstocks, each separate stem arising from a short annular caudex: stem and leaves dull brownish-green, glaucescent, turning dark brown, stiff, closely striate, transversely rugulose or granulose between the nerves, the edges rough-serrulate or becoming nearly

smooth: leaves stiff and erect, becoming flexuous in withering, attenuate-acute, 2-4 mm. wide, 25-45 cm. long: stems 15-35 cm. high, 2-3 mm. wide, prominently winged, above passing into an erect, often elongated, bracteal-leaf subtending a lateral-appearing cluster of 2-6 short-peduncled spathes and rarely also a branch bearing shorter peduncles; peduncles narrowly wing-margined, the edges obscurely roughened or becoming smooth, 2-6 cm. or even 10 cm. long, slightly curved, approximate and subequal, the outer two or three arising from a cluster of bracts borne on a very short prolongation of the stem. At flowering time the spathes are contiguous in a subsessile cluster: spathes erect or deflected, 14-19 mm. long, 3-4 mm. wide, dull green or slightly purplish, the bracts conspicuously hyaline-margined, subequal, stiff-herbaceous, striate-nerved, somewhat carinate, rather rigidly acuminate, the outer one sheathing for 2-4 mm. at base: interior scales crowded, at maturity exerted: flowers numerous, 8-12, rather large, violet; perianth delicate, becoming 12 mm. or more long; staminal column 5-6 mm. high: capsules on pedicels 15-20 mm. long spreading or recurved from the tip of the spathe, 4-6 mm. high, trilobate-obovoid or subglobose, impressed at base and retuse, drying dark: seeds black, rugulose, becoming over 1 mm. in longer diameter.

The type is Nash's no. 133, "Plants of Central Peninsular Florida" collected in vicinity of Eustis, Lake County. This distribution furnished many excellent specimens in flower and early fruit collected, "March 20, 1894, in dry, sandy soil along road in high pine land region."

The Philadelphia Academy Herbarium has a specimen just in flower collected March 5, 1888, at Okahumpka, Sumpter County, by Isaac Burke.

The earliest collector of the plant would appear to have been Chapman, judging from an old sheet bearing his signature, now in the Herbarium of Columbia University, labeled "Florida, on Sand Hills, 1842."

On the strength of this specimen I drew attention to the plant three years ago in the paper previously referred to and published a brief description. The present description, which was ready for the press when the plant received its recent christening by Professor Greene, is given in full, being based on fairly extensive material, including flowers and fruit which Professor Greene had not seen.

Sisyrinchium tortum

Stiff and erect in thin tufts coarsely fibrous at base arising from a dense cluster of rather stout fibrous roots; 15–30 cm. high, not turning dark in drying; leaves firm, the larger ones equaling the stems or nearly so, finally close-striate and faintly vermiculate-rugulose between the nerves, like the stems mostly 1.5–3 mm. wide with the edges smooth or obscurely denticulate-roughened; stem wing-flattened, usually one to four times spirally twisted and sometimes forming a shallow sigmoid curve; node usually only one, bearing a short erect bracteal leaf subequal with the two peduncles or shorter; occasionally a lower node bears two longer and more slender erect peduncles; bracteal-leaf with a broad clasping base which is strongly striate and oppositely more or less bicarinate; terminal peduncles two, rarely three, short, 2–5 cm. long, parallel or divergent, usually slightly unequal; spathes usually abruptly broader and thicker than the peduncles, 10–16 mm. long, becoming 3 mm. wide; bracts subequal or either one the longer, rather thin and membranous, striate-nerved, the outer one obtuse, or sometimes acute, the margins broadly hyaline, sometimes to the apex, united-clasping for 1–3 mm. at base; inner bract often broadly obtuse and scarious at apex; interior scales narrow and attenuate, shorter than the bracts; flowers pale blue on slender, loosely erect, finally exserted pedicels 15–22 mm. long; perianth 8–10 mm. long, the rather broad segments very delicately nerved; staminal column short, 2–4 mm. high. Capsule not seen.

Mississippi and Florida: Biloxi, Miss. Professor S. M. Tracy, March 15 and 20, 1898, just in flower. St. John's River, Florida, in Herb. Acad. Nat. Sci. Philadelphia, a single specimen on a sheet bearing also specimens of *S. xerophyllum* Greene, and *S. Florida-num*, the former collected by Isaac Burke in 1888.

Apparently nearest *S. xerophyllum* Greene, but unmistakably distinct.

Sisyrinchium Carolinianum

In loose tufts fibrose-coated at base, arising from erect or ascending rootstocks, the roots thickly clustered and rather coarsely fibrous, plant pale and glaucescent, often rather a bright yellowish green; leaves often much shorter than the stem, though sometimes reaching the first node, rather thin and openly erect, rather weakly striate-nerved, mostly 2–3 mm. wide or a few much broader, even 5 mm. wide, acuminate, the margins usually distinctly serrulate: stems erect, 2–3 mm. wide, broadly winged, the edges mostly serrulate or even ciliolate; nodes of stem one or two, each bearing a foliaceous bracteal leaf and two or three rather long

more or less diverging peduncles; prolongation of stem beyond the first node commonly 5–7 cm. long and somewhat outcurved; peduncles 4–8 cm. long, often ciliolate-denticulate: spathes green or sometimes purplish, as a rule not at all deflected, 15–20 mm. long, the bracts sub-equal or either one slightly the longer, varying from herbaceous-attenuate to scarious-obtuse and mucronulate; interior scales about half the length of the bracts: flowers 3–8, on very delicate slightly exerted, loosely erect pedicels; perianth very delicate, pale violet-blue, 8–10 mm. long; staminal column 4–5 mm. long; fruit not seen.

Western North Carolina and central South Carolina to Georgia, Alabama and Mississippi. Beginning to flower in the Carolinas in early May, at its southern limit a month earlier.

North Carolina: near Columbus, Polk Co., E. C. Townsend.

South Carolina: Andersonville, Anderson Co., Professor Lewis R. Gibbes, 1886. Type, in Herbarium N. Y. Botanical Garden; near Hamburg, Gibbes; Camden.

Georgia: Augusta, A. Cuthbert; Stone Mountain, Dr. Small.

Alabama: Auburn, F. S. Earle and C. F. Baker; Mobile, Dr. Chas. Mohr.

Mississippi: E. Hilgard.

Appearing somewhat intermediate between *S. graminoides* Bicknell and *S. Atlanticum* Bicknell, but perfectly distinct from both.

Dr. Mohr's specimens from Mobile and those from Mississippi are aberrant and may represent yet another species.

Sisyrinchium Floridanum

Tufts densely fibrillose at base, roots clustered, slender and wiry, stems and leaves 25–40 cm. high, pale dull green and glaucescent, not discoloring in drying, minutely crystalline-punctulate; leaves numerous, equaling the stems or shorter, stiffly erect or ascending, becoming flexuous in withering, mostly 2–3 mm. wide, rarely 4 mm., closely and firmly striate, attenuate to the terete or sub-terete slender-pointed apex, the edges smooth; stems sub-terete with narrow but firm wing-margins, 2–3 mm. wide, the edges smooth, bearing near the top a slender, erect bracteal leaf, shorter than the 2–3 usually erect peduncles, sometimes erectly prolonged beyond the node and bearing a second cluster of three shorter peduncles; peduncles very slender, mostly less than .5 mm. wide, narrowly margined, smooth or sometimes obscurely denticulate, subequal, or usually so, 5–10 cm. long, transversely constricted below the spathe: spathes green or

slightly purplish, mostly erect, narrow, 15–20 mm. long; bracts subequal, striate-nerved, hyaline margined, attenuate, mucronulate-acute or aculeolate, or the apex of the inner one apiculate from a narrowly scarious-obtuse or even bifid tip, the outer one clasping for 2–5 mm. at base; interior scales about equaling the bracts or slightly exserted; flowers 5–11, on slender exserted pedicels, pale blue, perianth delicate, about 10 mm. long: capsules pale green or purplish tinged, trigonous-subglobose or obovoid, abruptly contracted above and below, 3–4 mm. high, on pedicels 20–25 mm. long, exserted and slightly diverging for about quarter of their length: seeds not fully mature.

Based chiefly on Nash's no. 13, "Plants of Central Peninsular Florida"; collected "near Lake Dot, Eustis, on dry sandy hillside, March 12, 1894." In flower and fruit.

The same plant was collected by Prof. Underwood, also at Eustis, in 1891, and further specimens have been examined as follows: Hibernia, March, 1869, W. N. Canby; Pine Barrens near Jacksonville, March 17, 1894, A. H. Curtiss.

Sisyrrinchium Nashii

Nearly related to *S. Floridanum*, but much smaller and slenderer, and flowering in June and July instead of March.

Very slender and delicate, growing in thin wisps of a few stems and leaves sheathed with a dense fibrillose coating around the base, leaves few, erect, about half the height of the stem, .5–2 mm. wide, rather less closely and strongly striate than in *S. Floridanum* and frequently denticulate, especially towards the scarcely terete apex: stems few, erect, 20–30 cm. high, mostly 1 mm. or less wide, the very narrow margins often, or usually, minutely denticulate; leaves, stems and peduncles sometimes obscurely roughened with minute points on the sides: bracteal leaf almost setaceously slender, much shorter than the peduncles; peduncles 1–3, almost filiform, often not perceptibly margined, more or less unequal, mostly 4–6 cm. long: spathes narrow, 13–15 mm. long, the bracts mostly thinner and less sharp-pointed than in *S. Floridanum*, the inner one frequently surpassing the outer and scarious-obtuse at the apex; flowers smaller than in *S. Floridanum*: capsules pale, 2–3 mm. high, subglobose or often broader than long on slenderly exserted subspreading pedicels 17–22 mm. long: seeds subglobose, black, finely rugulose-pitted, with a large umbilicus.

Based on Nash's no. 1395, "Plants of Central Peninsular Florida" collected near Lake Swatara, Eustis, in dry sandy soil of

low pine land region, July 24, 1894, in flower and mature fruit ; and Nash's no. 1914, collected at Eustis, June 11, 1895, in full flower and with very young fruit.

So near to *S. Floridanum* that I should scarcely have thought of looking for specific differences between the two plants but for the wide difference in their flowering periods as shown by the labels. Mr. Nash is satisfied that the plants are distinct and recalls that in the field he regarded the smaller plant of low pine land as certainly different from the similar species collected in the same region, but in high pine land four months earlier in the season.

Sisyrinchium rufipes

Early flowering stage : Thinly tufted from ascending rootstocks, the old leaves disintegrating to form a loose coating of bright rufous-red fibers about the base of the plant. Stem and leaves rather bright pale green and glaucescent partly turning a dull brownish green ; leaves very slender, about the height of the stem, straight and erect but becoming widely flexuous in withering, 1-1.25 mm. wide, slenderly attenuate, more or less granular-scabrous between the close nerves, the margins finely sharp-serrulate ; stems erect, about 1 mm. wide, narrowly margined, the edges closely appressed ciliolate-serrulate ; bracteal leaf slender and erect, subtending two short suberect or outcurved peduncles and sometimes also a branch bearing a bracteal leaf and two short-peduncled spathes ; branches and peduncles hirsutulous-ciliolate on the edges and often roughened with minute points on the sides : spathes short, about 12 mm. long, the bracts somewhat divergent, sharp-acuminate or the inner one scarious-obtuse and apiculate, the outer one hyaline margined below and slightly sheathing at the base : flowers 2-5, small, blue, on delicate slenderly exserted pedicels 15-17 cm. long ; perianth about 8 mm. long ; stamineal column 4 mm. high.

Georgia : Augusta, A. Cuthbert, "dry sand hills," March 24th. In herbarium J. K. Small.

Imperfect specimens from Summerville, South Carolina, collected by Professor Lewis R. Gibbes, April 9, 1850, just in flower, are probably to be referred here. They are more slender than the type with flexuous stems and leaves, and are nearly smooth throughout, but with the bracts minutely granular-scabrous.

In Herb. N. Y. Botanical Garden.

A specimen in Herb. U. S. Nat. Mus. no. 220, 346, wet pine

barrens, Craven County, North Carolina, July 3d (G. McCarthy) doubtless also belongs here, but shows a mature plant of very different aspect. The stems are tall, and about twice spirally twisted, the tallest 47 cm. high and bearing at the node two slender peduncles and a longer divergent branch terminating in a cluster of three peduncles; the spathes are slenderer and longer than in the type, with narrow stiffly attenuate slightly unequal bracts. The capsules are brown and thick-walled, ovoid subglobose, and 3.5 mm. high; the immature seeds are rugulose-pitted and about 1.25 mm. in diameter. The stem and leaves, slightly broader than in the type, have dried very dark, but they show the same character of densely ciliolate-serrulate margins and also indications of granulose roughening on the sides; the fibrous tuft at the base of the plant is of much the same character as in the type but of a duller, more brownish color.

Sisyrinchium fuscatum

Growing in thin tufts, 15–50 cm. high, fibrose about the base, and arising from rather stout rootstocks and clustered widely spreading fibrous roots. Plant dull green and glaucescent, crystalline punctulate, discoloring in drying, sometimes becoming almost black: leaves long and slender, but shorter than the stems, firm and erect, becoming flexuous, .5–2.5 mm. wide, acute or slenderly subterete at the apex, strongly close-striate, the edges smooth or denticulate-roughened: stems long and slender, erect, .75–2 mm. wide, at least the wings distinctly striate, the edges minutely denticulate, becoming smooth; bracteal leaf short, and erect, attenuate above, the broader basal portion strongly close-striate, surpassed by the two closely approximate and subequal, erect, slender peduncles, which are subterete and only 2–6 cm. long: spathes erect, narrow, but abruptly wider than the constricted peduncle, 15–18 mm. long, the bracts equal or nearly so, stiffly herbaceous and firmly close-striate, closely approximate, cuspidate-acuminate, the outer one clasping for 2–4 mm. at base; interior scales much shorter than the bracts: flowers 5–8, blue, on erect, more or less exserted pedicels, 18–25 mm. long; perianth about 10 mm. long, the segments narrow, rather closely and strongly nerved: capsules 2.5–4 mm. high, broadly subglobose, drying dark.

Western Florida to Mississippi.

Flowering from March to May.

Florida: Apalachicola, Chapman.

Alabama : Flomaton, Escambia county, April 23, 1898, C. F. Baker.

Mississippi : Biloxi, Prof. S. M. Tracy ; Ocean Springs, Miss Skehan.

I find two sheets of this species in Herb. Missouri Botanical Garden, "ex coll. D. V. Dean," but without other record.

Sisyrinchium flagellum

Very slender and flexuous in thin tufts, not fibrose at the base, the roots becoming rather coarsely fibrous ; pale dull green and slightly glaucescent, darker in drying, 20–32 cm. high. Leaves as long as the stems or nearly so, narrow and flexuous, 5–1.5 mm. wide, distinctly rather few-striate, smooth-edged or serrulate at the attenuate acute apex : stems erect, usually more or less flexuous, and geniculate at the nodes, .75–1.5 mm. wide, narrowly wing-margined, smooth-edged ; nodes one or two, remote, the lowest about midway in the stem or higher, supporting a long leaf and one or two long slender peduncles, the upper node bearing a shorter leaf and two or three peduncles ; peduncles very long and slender, 5–12 cm. long, mostly .5 mm. wide, smooth-margined, subequal, approximate or slightly divergent : spathes often abruptly deflected, narrow, 15–20 mm. long, the bracts slightly keeled to the apex, subequal or the inner one longer, the outer one narrowly acuminate and sharp-pointed, hyaline-margined below and clasping for 5–7 mm. at base ; the inner one often scarious margined to the abruptly mucronulate apex ; interior scales much shorter than the bracts : flowers not well made out, of some shade of blue and apparently of medium size : capsules 4–6 on erect slightly exserted pedicels 18–20 mm. long, trilobate-subglobose, retuse and impressed at base, about 4 mm. high, drying brown, the surface minutely rugulose : seeds globose, finely alveolate, 1 mm. or more in diameter.

South and West Florida : "Pine Key, Blodgett." In Herbarium of Columbia University.

Manatee County, Dr. J. T. Rothrock ; "open glades," March 5, 1887 ; in flower and fruit. Specimens in herbarium of College of Pharmacy, New York and Philadelphia Acad. Nat. Sci.

Sisyrinchium Miamiense

About 20 cm. or more high, growing in small erect tufts from short descending rootstocks, the roots long, somewhat woody and nearly simple. Plant apparently dull green and glaucescent, drying dark : leaves erect, about three quarters the height of the

plant, 1-1.5 mm. wide, cuspidate-acute, with somewhat thickened corneous tips, rather strongly but not very closely striate-nerved, serrulate: stems rather loosely erect, about the width of the leaves, distinctly wing-margined, denticulate-serrulate, bearing two or three erect peduncles at the top and sometimes an ascending branch lower down; pedunces approximate, 3-7 cm. long, their margins serrulate to smooth: spathes mostly erect, 13-15 mm. long, the bracts rather sharply keeled to the apex, the outer one stiffly acute, slightly hyaline-margined below and clasping for 1-4 mm. at base, slightly surpassing the inner, which is scarious-obtuse at the apex and apiculate; flowers 5-8, blue, apparently of medium size; capsules on exserted pedicels 15-18 mm. long, 3-5 mm. high, trigonous-obovoid or somewhat pyriform, mucronulate, thick-walled, brown, minutely rugulose: seeds irregularly subglobose and bluntly angled, 1-1.25 mm. in diameter, faintly rugulose-pitted, obscurely umbilicate.

Southeast Florida; Miami, Dade County, Charles L. Pollard and G. N. Collins, April 4-7, 1898; Plants of subtropical Florida, no. 264; last flowers and mature fruit.

Sisyrrinchium scoparium

Pale green and glaucous, growing in close tufts fibrose at base, from contracted rootstocks and rather coarsely fibrous roots, 15-50 cm. high. Leaves erect and very slender, equaling the shorter stems of the tufts but much shorter than the longer ones, 1 mm. or less to 1.75 mm. wide, very acute, the edges sometimes obscurely roughened; stems equally narrow with the leaves, very smooth, the striate wing-margins sometimes obscurely roughened above on the edges; inflorescence when well-developed appearing somewhat flabellately short-branched from two often approximate nodes of the stem, the lower node bearing one or two short, slender peduncles, the upper one two or three shorter peduncles; the peduncles and short branch all slightly diverging; bracteal leaves slender, rarely surpassing the spathes: peduncles 2-5 mm. long or the lower ones longer, denticulate on the margins; sometimes the stems bear but one node and two short peduncles; spathes erect, 12-18 mm. long, the bracts rather strongly close-striate, acuminate, subequal, the tips finally spreading; outer one narrowly hyaline-margined below, clasping for 2-5 mm.; interior scales about three quarters the length of the bracts; flowers 6-11, violet blue; perianth apparently with rather narrow segments, about 10 mm. long; capsules clustered on fascicled distinctly margined pedicels 14-20 mm. long, somewhat obovate or oblong-subglobose, 2-5 mm. high, thick-walled and drying dark, remaining slightly puberulent at maturity: seeds globose, black, finely pitted, 1 mm. in diameter.

Coast of Mississippi. Flowering from March to May.

Biloxi, April 27, 1898, C. F. Baker. Type in Herb. Alabama Biological Survey, no. 1496, also Biloxi, April 2, 1898, S. M. Tracy.

Sisyrinchium implicatum

Growing in close tufts from contracted rootstocks and producing a dense entangled mass of slender fibrillate roots; often assurgent at base, the numerous weak stems flexuous-erect or spreading in a loose entanglement, pale dull green, perhaps slightly glaucescent. Leaves very slender, weakly erect or flexuous, .5–1 mm. wide, 5–15 cm. long, narrowly blunt-pointed or acute, finely close-striate, the edges smooth, or serrulate when young; stems equally slender with the leaves narrow-margined, the edges smooth or obscurely denticulate, geniculate near the top at the single node and bearing 1 or 2 short peduncles with deflected spathes; peduncles almost capillaceous, margined slightly curved or straight, approximate, 2–4 cm. long, surpassing the slender bracteal leaf: spathes very small, the bracts somewhat membranous and finely nerved, equal, or either one slightly longer than the other; the outer one 10–15 mm. long, contracted-clasping for 3–5 mm. at base, narrowly acute, hyaline-margined below; inner bract acute or scarious-obtuse and apiculate: flowers 3–5, small, on pedicels slightly exserted or scarcely so; perianth very delicate and faintly nerved, pale blue, apparently about 8 mm. long; staminal column about 5 mm. high.

Mississippi: Calhoun Co., "Wet bottoms," April 1858, E. Hilgard. In Herbarium Missouri Botanical Garden.

Sisyrinchium rosulatum

Prostrate or ascending in rosulate tufts, or sometimes nearly erect, pale dull green or glaucescent not turning dark in drying, the denser tufts from contractedly short-branched woody rootstocks, the roots delicate and fibrillate: tufts sometimes very small, becoming 25 cm. in diameter: basal leaves short, 2–8 cm. long, 1–2 mm. wide, the broadened base membranous and hyaline-margined, the weak nerves becoming rather distant, in larger leaves .5 mm. apart: apex of the leaf apiculate acute or sometimes more attenuate, the margins denticulate to closely sharp-serrulate or even sub-ciliolate: stems of the smaller tufts very short, only 6–30 mm. long, often concealed by the leaves, bearing one or two much longer peduncles: stouter plants may become 20 cm. high, the stems with two remote nodes each supporting an erect leaf and mostly two peduncles, or rarely the lower node developing a slender erect branch: stem slender, subterete, narrowly margined,

the edges denticulate-serrulate: stem leaves much shorter than the peduncles, rather broadly flat-sheathing for 10–15 mm. above the node: peduncles long and slender, approximate or diverging, 2.5–10 cm. long, often more broadly margined than the stem, the edges aculeolate-denticulate: spathes relatively large, straight or deflected slightly transversely constricted at base, mostly about 2 cm. long, both bracts somewhat foliaceous, the outer one more attenuate and usually slightly the longer, rarely both bracts broadly foliaceous and prolonged, the inner one hyaline-margined nearly to the top, the outer one below the middle: flowers not seen, reported to me by Dr. Mohr as being of a reddish-purple or wine color: capsules 3–5, broadly subglobose, 2.5–3.5 mm. high on capillary flexuously spreading pedicels 2–3 cm. long, pale, but purplish-tinged along the sutures: seeds numerous, very small, .5–.75 mm. long, finely alveolate, umbilicate, assymmetrically cuneate and angled.

Dry open places in sandy soil, coast of South Carolina and Alabama.

South Carolina: Sullivan's Island, May 8, 1852, Professor Lewis R. Gibbes. In fruit. In Herb. N. Y. Botanical Garden.

Alabama: Mobile, April 6, 1896, May 5, 1896, Dr. Charles Mohr. In fruit. In Herb. Dr. Mohr and Missouri Botanical Garden.

Very distinct from any of our eastern species, having its affinity with certain South American forms and a Mexican and Central American species which is perhaps unnamed.

Sisyrinchium furcatum

Loosely tufted, from rather stiff nearly simple fibrous roots, 10–15 cm. high; dull green, drying rather dark, mostly purplish about the nodes and bracts. Leaves about the height of the plant, erect, attenuate-acute, .5–1.5 mm. wide, rather thin, finely striate-nerved, the edges obscurely denticulate-roughened to smooth: stems 1–1.5 mm. wide, the wing-margins distinctly several-striate and denticulate, casually simple but commonly forking into 2 or sometimes 3 peduncles 3–6 cm. long, subtended by a slender, erect, bracteal leaf of about equal length: spathes relatively broad, about 3 mm. wide across the middle, the bracts delicately nerved and thin membranous on the sides, with broadly hyaline margins, mostly acuminate, the outer one usually prolonged beyond the inner 3–6 mm. and clasping for 2–3 mm. at base, the inner one often emerging rather abruptly; interior scales rather broad, brownish-tinged, much shorter than the bracts: flowers 4–6, blue; perianth very delicate and faintly nerved, 8–10 mm. long; staminal column 4–5 mm. high: fruit not seen.

Southeastern Louisiana : Hammond, Tangipahoa Co., Lewena Gallup, April 4, 1889, "pine lands," in full flower. In U. S. Nat. Herb.

Sisyrinchium sagittiferum

Thinly tufted and slightly fibrillose at base, apparently not glaucous, drying dark, 10–15 cm. high. Leaves about equaling the stems .5–1.5 mm. wide, thin, striate-nerved, acuminate, the edges serrulate to smooth: stems very slender, .5–.75 mm. wide, margined to narrowly winged, the wings distinctly striate, mostly denticulate-roughened or above even papillose-aculeolate on the edges; spathes small, erect, terminating the stems and four or five times as broad, subequal or the outer one prolonged: outer bract 11–27 mm. long, acuminate or attenuate, sometimes surpassing the inner bract 15 mm., the white-hyaline margins only slightly united at base; inner bract 10–12 mm. long, the margins broadly white-hyaline, the apex abruptly acute or broadly scarious and truncate or emarginate with excurrent midvein: interior scales equaling the inner bract or nearly so: flowers 3–7, small, on almost hair-like flexuously exerted pedicels about 15 mm. long: perianth apparently about 8 mm. long, color faded out; staminal column 4 mm. high: capsules undeveloped.

Texas, May, 1839, Dr. Ridell. In Herb. Dr. Chas. Mohr.

Sisyrinchium scabrellum

Caespitose in close erect tufts, arising from a dense cluster of fibrous roots, 25–40 cm. high, slightly fibrillose at base; dull pale green and glaucescent, the spathes often yellowish green and purplish, the rather long sheathing bases of the leaves purplish-tinged. Leaves stiffly erect, three quarters the height of the stem, very narrow, 1–2 mm. wide, tapering and cuspidate-acute, closely striate, scabrous all over or even canescently incrustate with minute setulose papillae, less so or quite smooth above, sometimes nearly smooth throughout: stems simple, stiff and slender, 1–2 mm. wide, flattened, sometimes glabrate but usually scabrous, at least below, sometimes equally so with the leaves, the finely-striate wing-margins roughened on the edges or even minutely hispidulous-aculeolate: spathes geminate at the top of the stem (in one instance three together) sessile or the outer one short-stipitate, the bracts herbaceous and striate, encrusted with minute whitish points or almost hispidulous-scabrous; primary bract stiff and erect, much elongated, 3.5–11.5 cm. long, slenderly attenuate, or broadened and foliaceous above the spathe, usually smooth or nearly so above; inferior outer bract attenuate, often slenderly prolonged, 1.2–3.8 cm. long, surpassing the inner bracts, which are less herbaceous, scarious-mar-

gined and acute or mucronulate; interior scales shorter than the inner bracts: flowers 3-6, pale blue, on slender, loosely erect or flexuous, much exserted pedicels 1-2 cm. long; perianth delicately membranous, 8-12 mm. long; staminal column 4-6 mm. high. Mature fruit not seen.

North Carolina: Buncombe County, near Biltmore, May 10, 1898, in full flower, ex. Biltmore Herbarium; Stanley County, at the Falls of the Yadkin River, April 20-24, 1896, just in flower. John K. Small.

Dr. Small's specimens are darker green and much less scabrous than those from Biltmore, with larger and more foliaceous primary bracts and thicker roots.